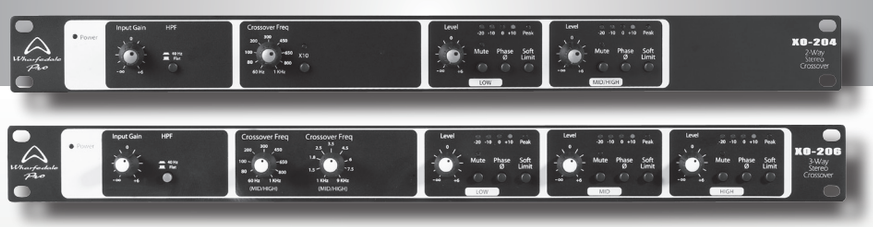

XO Series Crossovers

OPERATING MANUAL AND USER GUIDE

XO - 204 / XO - 206

www.wharfedalepro.com

IMPORTANT WARNINGS & SAFETY INSTRUCTIONS

1. **READ ALL INSTRUCTIONS carefully and become familiar with the features and functions of these products before operating them.**

2. **RETAIN THESE INSTRUCTIONS for future reference.**

3. **COMPLY WITH ALL WARNINGS – All warnings and instructions for this product should be adhered to.**

4. **USE WITH AMPLIFIERS – In order to avoid damage to drivers and other equipment, it is advisable to establish and follow a routine for powering up and powering down a sound system. With all system components connected, turn on source equipment (mixers, signal processors, record and playback units, etc.) BEFORE powering up amplifiers. Transient voltages from powering up source equipment can damage speakers if amplifiers are already turned on. Make sure that amplifier volumes are set to their minimum settings and power up any system amplifiers LAST. It is recommended that all system components be allowed to stabilize for several seconds before any source signals are introduced or level setting adjustments are made. Similarly, when shutting systems down, turn all amplifiers off first, before powering down any other system components.**

5. **CABLES – Always use shielded or microphone cables for connection between amplifiers and other electronic devices. Use only approved speaker cables with proper connectors.**

6. **MAINS SUPPLY AND SAFETY – The main operating voltage of Wharfedale electronics is shown on the rear panel of the device. If it does not match the voltage in your area, contact your dealer.**

7. **CAUTION – Professional sound reinforcement systems are capable of generating very high sound pressure levels and use high voltage. Use care with placement and operation to avoid exposure to excessive volume levels, water or moisture.**

8. **SERVICE – There are no user serviceable parts inside this product. Users should not attempt to service this product. Warranty nullification could result if this is attempted.**

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WHAT ABOUT THE XO SERIES CROSSOVERS?

The XO Series consists of two models: XO-204 & XO-206 are high quality, professional crossover systems. The XO-204 is a high quality two channel, two-way Crossover and the XO-206 is a high quality, two channel, three-way crossover. Both models have a mono summed subwoofer output.

The continuously variable crossover frequency controls allow you to "fine tune" the sound system's full range response by adjusting the crossover points, the amplitude of the low pass and high pass outputs.The mono subwoofer output allows you to add a single subwoofer to an existing stereo setup. Other features include front panel mounted Mute, Phase and Soft Limit switches to allow you to tailor the system response using various loudspeaker components.

The XO Series uses balanced and unbalanced Input/Output connectors to allow use with a variety of external devices. The rack-mountable chassis allows you to quickly install the units into an equipment rack or your audio cabinet.

INTRODUCTION

Wharfedale XO Series Crossovers are the result of many years of experience in the use, design and manufacturing of professional sound reinforcement products. We take great pride in engineering and building every Wharfedale Pro product and wish to thank you for entrusting us with your sound.

From the time Gilbert Briggs built his first loudspeaker in 1932, to the present, Wharfedale Professional products have maintained the same standard of quality in components, workmanship and performance. Actually, Wharfedale is one of a few present day manufacturers that design, engineer and build all of their own electronics.

Please take a few minutes to read this manual completely in order to ensure that you get the most out of your system.

XO SERIES CROSSOVER OVERVIEW:

The XO Series crossovers are accurate, high quality, frequency dividing networks. This allows you to tailor your system to make it sound great. With low distortion and flexible features, these crossovers are the right tools to bring to the show.

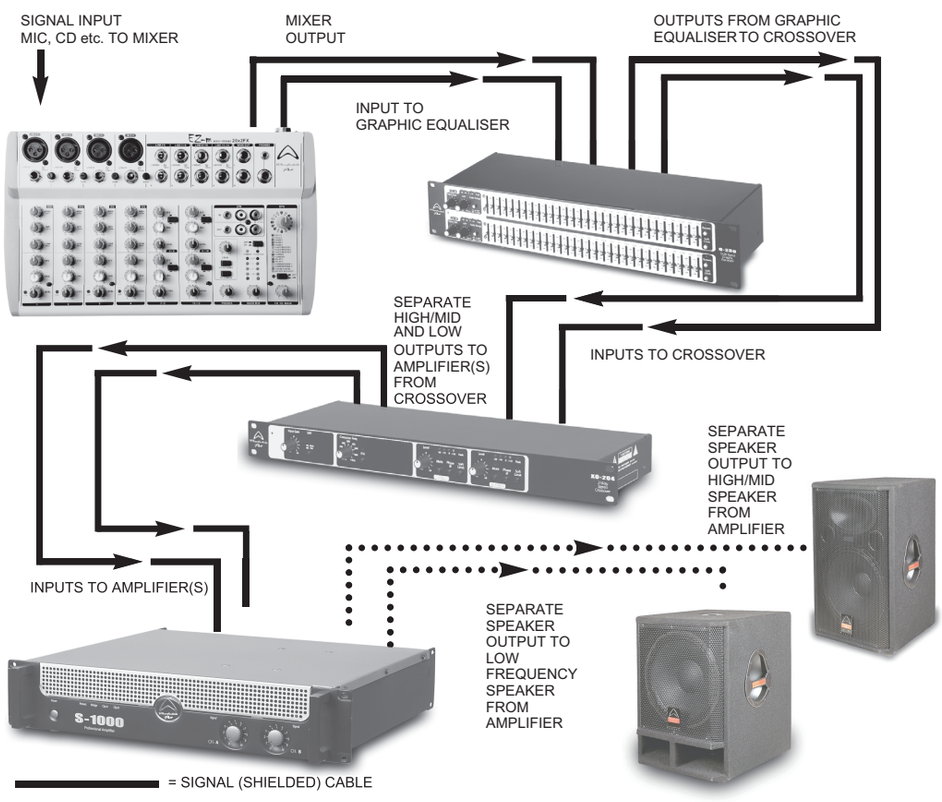
The XO Series has many user-friendly features. These easy to adjust and use features include: variable input gain and frequency select controls, Subwoofer output, balanced and unbalanced input and output jacks, phase switch, mute switch, and a soft limit switch.

FEATURES

- **Two models:**
  - **XO-204 - 2-way**
  - **XO-206 - 3-way**
- **Variable Crossover Frequency:**
  - **XO-204: 60Hz – 1kHz with 10x switch**
  - **XO-206: 60Hz – 1kHz (LOW/MID), 1kHz - 9kHz (MID/HIGH)**
- **Variable Input Gain: ∞ to +6dB**
- **Easy to read LED meters**
- **1/4” TRS Mono Subwoofer output (balanced/ unbalanced)**
- **1/4” TRS balanced/unbalanced inputs/outputs**
- **Front panel switches for easy access:**
  - **HPF - 40Hz/ Flat**
  - **Mute for each output: low, (mid), high**
  - **Phase switch for each output: low, (mid), high**
  - **Soft Limit switch for each output: low, (mid), high**

BLOCK DIAGRAM

TYPICAL WIRING DIAGRAM FOR THE XO SERIES CROSSOVER IN SYSTEM SETUP



SETTING UP

The XO Series Crossovers are easy to install and operate.

Before plugging in the XO Series Crossovers, or any electrical audio device, be sure that the power switch is in the off position, the volume control is all the way down (at 0 level) and all audio connections are made.

After power-up, you will need to set up the system; setting the crossover frequencies. Avoid distortion (or overdriving the input) as it can damage your system in the long term.

CONNECTIONS / WIRING

Connecting XO Series Crossovers to your system is straightforward. You simply plug in your cables (microphone or line level) from the output of the mixer to the input of the crossover; then from the crossover output to the next component in your system, often it is an amplifier. Always use good quality microphone (2 conductor + shield) cable. After you plug in the components, you must adjust the crossover frequencies and their relative levels to produce the best sound.

Crossover Adjustments:

- The XO Series Crossovers are ideal tools to make set up and operation of your system easy and accurate.

- Your best starting place is to follow the loudspeaker manufacturer's recommended crossover points.

- Adjust the crossover points of the High Pass and Low Pass outputs to match the frequencies recommended by the manufacturer.

- You will need to determine the correct output level of the low pass, the high pass and subwoofer outputs. This is best done with an RTA, but you can get close using your ears. It is similar to mixing the band, whatever sounds the best will be close.

- Watch the meters on the amplifiers to make sure the input level is not clipping (i.e. Too much voltage on the amplifier's input)

- In a simple system, the next component is the amplifier. Because your previous adjustments have resulted in the cleanest, loudest sound coming from the mixer to the EQ, it is not uncommon for the volume controls on the amplifier to be less than maximum (a/k/a "11"). Don't worry, this means you have plenty of room to get louder. If your amplifier volume control is "max'd out" when you are at this point in the setup, you have no place to go. You must add to your system; either more amps or more speakers.

- The bottom line is to keep watch over your meters, they will tell you if the sound levels throughout the system are in keeping with good practices.

Tuning the Room:

A continuously variable frequency crossover is a very valuable tool for the traveling musician. It allows you to get the best sound in a variety of venues. As we know, all rooms are not created equal. They have their own personality. That is to say, your sound system will not sound the same from room to room. Using equalisers and crossovers correctly will help you maintain "your sound".

- **The controls on the crossover provide level adjustment to the frequency range you send to the amplifier and ultimately the loudspeakers.**

- **To tune the system to the room, it takes some practice and patience. Remember to find out the speaker manufacturer's recommended crossover frequencies for the various elements in order to set the crossover accurately. Be careful when doing this by "ear". What sounds right to you may be wrong for the components' long-term reliability. To be safe, set the output level controls all at maximum so that they are at the same output level (at lower settings, potentiometer tolerances could cause them to be different) then counter-adjust (lower) the crossover's input level to avoid over-driving the power amps.**

- **When your ear gets calibrated, you can tune the system by ear.**

- **Use a reference-test CD or tone generator to play sine wave tones ranging from 50 to 16k Hz through the system and adjust the frequency response of the system so the sound from the bass, mid and high frequency speakers is about the same level. Minor adjustments by ear can be made later, but only minor adjustments.**

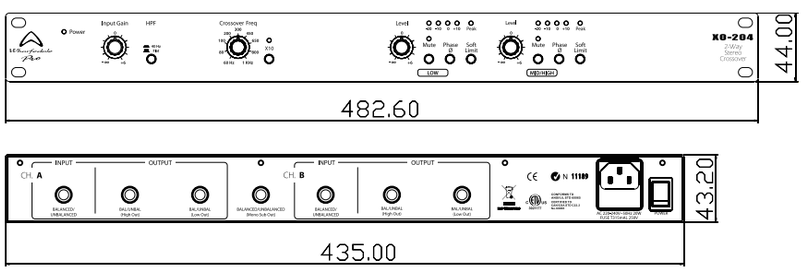
- **Leave the crossover alone until the next gig or the room changes significantly. However, if it changes too much, it is too late to run the above procedure and you must "do it by ear".**

SPECIFICATIONS

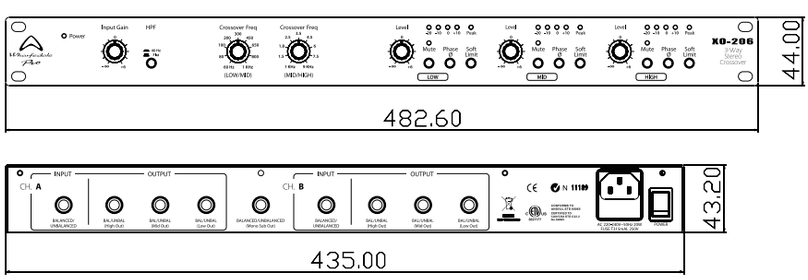
	XO-204	XO-206
INPUT/ OUTPUT		
Connectors:	1/4" TRS (pin 2 hot)	1/4" TRS (pin 2 hot)
Input Impedance:	Balanced 20k ohm, unbalanced 10k ohm	Balanced 20k ohm, unbalanced 10k ohm
Max Input Level:	+20dBu balanced or unbalanced	+20dBu balanced or unbalanced
Output Impedance:	Balanced/ unbalanced 100ohm	Balanced/ unbalanced 100100ohm
Max Output Level:	+21dBu balanced/unbalanced into	+21dBu balanced/unbalanced
Subwoofer Output	1/4" TRS (pin 2 hot)	1/4" TRS (pin 2 hot)
SYSTEM PERFORMANCE		
Frequency Range	60Hz-10kHz	60Hz -10kHz
Frequency Response:	<10Hz to >40kHz, +2/-3dB	<10Hz to >40kHz, +2/-3dB
HUM AND NOISE	-95dB	-95dB
Signal-to-Noise:	90 dB	90 dB
THD + Noise:	<0.004%	<0.004%
Interchannel Crosstalk:	<-80dB, 20Hz to 20kHz	<-80dB, 20Hz to 20kHz
FUNCTION SWITCHES		
Soft limit:		
HPF		
Phase		
POWER SUPPLY		
Operating Voltage:	100VAC 50/60Hz, 120VAC 60Hz,	100VAC 50/60Hz, 120VAC 60Hz,
Power consumption:	230VAC 50/60Hz	230VAC 50/60Hz
Mains Connection:	12W	16W
DIMENSIONS/WEIGHT	IEC receptacle	IEC receptacle
Dimension:	482x 250 x 46mm	482 x 250 x 46mm
Weight	2.92 kg	2.97 kg

Dimensional Drawings

XO-204



XO-206



WHARFEDALE PRO LIMITED WARRANTY

Wharfedale Pro products are warranted of manufacturing or material defects for a period of one year from the original date of purchase. In the event of malfunction, contact your authorized Wharfedale Pro dealer or distributor for information.

***Be aware that warranty details may differ from country to country. Contact your dealers or distributor for information. These terms do not infringe your statutory rights.**

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